

## **Year 2000 and 2001 Priority Actions**

### **Low Dissolved Oxygen in the San Joaquin River near Stockton - 9**

#### **1. General Description of the Action**

Identify oxygen depleting sources in the lower San Joaquin River and South Delta and compile initial strategy on corrective measures needed prior to development and implementation of BMPs.

Dissolved oxygen concentrations have decreased to below the 5 mg/l standard between June and November in the San Joaquin River near Stockton. The main channel near Stockton has been identified as a candidate Bay Protection and Toxic Cleanup Program hot spot. It appears that low dissolved oxygen concentration occurs over a ten-mile reach of the San Joaquin River and can reach as low as 2.5 mg/l in the fall. Oxygen depletion in the San Joaquin River is highest in the late summer and fall when high water temperature reduces the oxygen carrying capacity of the water and increases biotic respiration rates. Low or negative streamflow past Stockton reduce dilution and mixing, and respiration from algal blooms is high.

These low dissolved oxygen concentrations may act as a barrier to upstream migration of adult San Joaquin fall-run Chinook salmon that migrate upstream to spawn in the Merced, Tuolumne and Stanislaus Rivers between September and December. The San Joaquin population of Chinook salmon has declined, is considered a "species of concern" by US Fish and Wildlife Service and is a candidate for listing by National Marine and Fisheries Service. Low dissolved oxygen concentrations can also stress, kill or block migration of other fish. Our goal is to eliminate this impact on aquatic organisms.

Organic carbon or nutrients from algal blooms, petroleum products, wastewater effluent, urban runoff or confined animal operations and redox reactions may all contribute to the oxygen depletion in the River. In addition, San Joaquin River tributaries add oxygen-depleted water after storm water runoff events.

#### **2. Cost Estimates**

One year of sampling and analysis would cost about \$1 million. Some cost sharing may be available that could decrease the CALFED portion to about \$500,000.

Initiating corrective activities and continued monitoring would cost about \$1.0 million each year for about 5 years. After the initial 5 years, much of the worst problems should be corrected and the municipality and the state should have ordinances and laws in place to implement final stages of correction.

Some CALFED participation in the scope of study and the implementation methods is warranted. About one month of work for CALFED staff would be necessary over the term of the first year.

### 3. Program Administration and Governance

The CALFED Water Quality Program should oversee the scope of the project. A stakeholder process has begun to develop process by which the problems are identified and solved. CALFED and DWR participate in the stakeholder process. DWR should oversee contracting, and sampling.

### 4. Program Coordination

The Department of Water Resources could perform much of the sampling in coordination with other agencies such as the Regional Water Quality Control Board and the City of Stockton. The private entity, the Delta Keeper has also, at times, participated in DO sampling. Contracting should be done by DWR and any additional help needed for the sampling should be recruited by DWR.

### 5. Schedule

Source identification can start as soon as possible. The Low DO conditions of concern are manifest during the months of June through November. Sampling needs to be done during this time. Provided funding is secured, sampling can be started in October and November 1999 and continue into the winter. Results of this sampling can be interpreted and new sampling plans initiated in June 2000.